

Newsletter

Volume 4, Number 2
March - April 1987

This spring at the Arboretum ...

Walk the Wappinger Creek Trail to enjoy the wildflowers of April and May.

Sign up for an IES Ecological Excursion ... members get a special rate.

Become a Wildlife Volunteer!

Join our Sunday Ecology Programs on the first and third Sunday of each month.

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See the Spring Calendar on the last page of this Newsletter for information on all our current public programs.

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Looking ahead to summer ... plan now to attend the IES Perennial Garden dedication on June 27th.

The IES Newsletter is published by the Institute of Ecosystem Studies at the Mary Flagler Cary Arboretum. Located in Millbrook, New York, the Institute is a division of The New York Botanical Garden. All newsletter correspondence should be addressed to the Editor.

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IES Students Receive Certificates

The Institute of Ecosystem Studies offers programs leading to Certificates in Landscape Design and Gardening. On Friday evening, January 16th, the first Adult Education Program graduation ceremony was held, and students were awarded their certificates.

The ceremony began with welcoming remarks by IES Director Dr. Gene E. Likens, who spoke with pride of the Institute's public education program and of the graduating students. The keynote address, "The Natural Landscape", was given by Mr. A.E. Bye of A.E. Bye and Associates in Greenwich, Connecticut. Mr. Bye is a nationally-known landscape architect, and illustrated his talk with slides showing the art of his work. The program concluded with the conferral of certificates by IES Head of Education Dr. Alan R. Berkowitz and course instructors.

Gardening Certificate

Andrew Bartoes, LaGrangeville
Jeffrey Bateman, Carmel
Bruce E. Blake, LaGrangeville

Philip B. Burley, Poughkeepsie
Janice Cerchiara, Stormville
Rose Marie Gillin, Poughkeepsie
Marion R. Lockwood, Pleasant Valley
Shirley K. Long, Poughkeepsie
Harold E. MacAvery III, Hughsonville
Carol R. Perkins*, Millbrook
Norman T. Pratt, Wappingers Falls
Claudia G. Schachner, Pleasant Valley
Richard A. Wagner, Beacon

Landscape Design Certificate

Mary E. Daley, West Cornwall, CT
Jeffrey L. Futyma, Poughkeepsie
Judy Joffe, Poughkeepsie
Martha F. Kent, Poughkeepsie
Susan L. Tipton, Poughquag
Marcy L. Wagman, Fishkill
Barbro K. Waskiewicz, LaGrangeville

* also received a Certificate in Horticultural Therapy

A reception followed, giving students and their families the opportunity to talk with Mr. Bye, their instructors, and IES staff members.

Dr. Eisner's Insects

How many people are aware of the ways in which insects use chemistry to improve the quality of their short lifetimes? Some of us are a bit smarter about this subject following the March 6th visit by Dr. Thomas Eisner, one of the world's leading authorities on insect defense and communication. During his stay at the Institute he met with scientific colleagues and presented two public lectures about his research.

Dr. Eisner's outstanding photographs brought his insect subjects to life. In his Friday afternoon seminar on "Insect-plant

interactions: A chemical-ecological approach", for example, the female assassin bug was shown collecting a chemical from camphor weed and putting it on her abdomen. When she lays eggs she protects them with a covering of this camphor-like chemical; then the newly-hatched young use the same chemical to catch their insect prey. This is an example of an insect adopting a plant's chemical defense for its own protection.

Dr. Eisner described the widespread defenses of plants, and how different

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l. to r.: IES Chemical Ecologist Dr. Clive Jones, Dr. Eisner, and IES Director Dr. Gene E. Likens.

Vegetation History of the Arboretum

What do the trees in a forest tell about the way in which that parcel of land was used 50, 100, 150 years earlier? The casual hiker, bird-watcher or amateur botanist enjoying spring wild flowers may be unaware of the history lessons that the forest can teach . . .



Red Oak

During his year's stay at the Institute as a post-doctoral associate, Terrestrial Ecologist Jeff Glitzenstein investigated the relationships between vegetation and land use history in the Mary Flagler Cary Arboretum forest. Roughly 40% of the Arboretum's 778 hectares (1,924 acres) are forested. The remainder is primarily former agricultural land abandoned less than 60 years ago and now in herbaceous or shrubby vegetation.

IES Plant Ecologist Charles Canham has described three primary forest types at the Arboretum: chestnut oak, oak/hickory, and red maple. The chestnut oak type is dominated by chestnut oak and northern red oak with sugar maple, eastern hemlock and pignut hickory also present. In the oak/hickory forest, white oak and black oak replace the chestnut and red oaks; other major canopy species are red maple, pignut hickory and some shagbark hickory. The red maple forest type has few oaks at all, and is dominated by red maples, sugar maples and white pine.

Do these forest types correspond to the three main sorts of land use of the last century? Dr. Glitzenstein thinks that they do. He suggests that the chestnut oak forest is typical of land that was never cleared for agriculture but kept in continuous woodlot. On the other hand, the

oak/hickory stands are associated with former pastures and the red maple forests with land that was cultivated or tilled.

So . . . how is the detective work done? How could Dr. Glitzenstein establish what these forest areas used to be? Historical records, including data from the 1865 and 1875 population censuses on local farmland, and an aerial photograph taken in the 1930's provided some information. Other sources of information about past land use patterns are to be found on the land itself. During colonial times stone fences were commonly built around fields cleared for agriculture, so their presence in the woods is a good indicator of abandoned farmland. Soil characteristics of surface horizons can also be used to distinguish former agricultural areas from those continuously in forest.

Agriculture in New York State was at its peak between 1850 and 1870; 95% of the land in Dutchess County was cleared for farming as late as 1880. Abandonment of marginal farmland began during the following decade, as farm prosperity declined. Dr. Glitzenstein writes in his final report, "[since] virtually all land suitable for farming in Dutchess County was in fact in cleared farmland prior to about 1890, stands containing trees older than this age were very unlikely to have ever been cleared for agriculture". By coring the trunks of larger trees he could determine which areas were likely to have been in continuous woodlot, and in this fashion showed that most of the chestnut oak stands were in these areas.

However, review of land survey records

presented Dr. Glitzenstein with a question about these stands: From 1730-1800 forests in the vicinity of the Arboretum were of the oak/hickory type, not the chestnut oak type. How did the transition to chestnut oak come about in the continuous woodlots?

Disturbance in a forest can be caused by humans, for example through logging, and by natural forces, such as windstorms or blight. The typical result of a disturbance is the rapid growth of tree types that can sprout prolifically and grow rapidly. Chestnut oak is one of the most effective sprouters. When Dr. Glitzenstein studied the history of the continuous woodlots at the Arboretum, he found evidence suggesting that there was selective logging throughout the 19th and early 20th centuries, and that major natural disturbances had occurred during this period as well. These disturbances could well have favored growth of the chestnut oak, as did the shallow, rocky soil which was avoided by farmers.

Dr. Glitzenstein's hypothesis is that the oak/hickory forest stands now present at the Arboretum grew up on abandoned pastures. The patchy growth patterns of these stands are characteristic of areas where strong competition from established grasses tends to slow woody plant invasion. In addition, the heavy-seeded oaks and hickories may have some advantage over lighter-seeded species in competing with the grasses.

Finally, there is evidence to suggest that the third forest type present at the Arboretum, the red maple forest, is associated with land that was cultivated prior to its abandonment. The red maple, sugar maple and white pine are light-seeded species. Tillage provides an ideal bed for such seeds, eliminating competition by grasses as well as by heavier-seeded oaks and hickories.

* * * * *

The next time you walk in the forest, look for evidence of woodlot history. What types of trees are dominant? Is the vegetation on one side of a stone wall different from that on the other? Consider the topography . . . could the land at one time have supported agriculture? There is history written in the woods, yours just for observing.

For those interested in learning more about how to determine the history of local woodlots, keep an eye on the Institute's Sunday Ecology Program schedule. From time to time a walk dedicated to that challenge is offered.



Chestnut Oak

Eagle Excursion



Peter Nye and young bald eagle.

There are presently two nesting pairs of bald eagles in New York State, a 100% increase since the start of this decade but a disastrous decline overall: prior to the 1950's, there were over 70 nesting sites in the state. The decline was due to competition by humans for waterfront land, to indiscriminate killing and to the heavy use of pesticides. Federal legislation is helping the bald eagle make a comeback, however, and New York State has been a leader in research and management of this endangered species.

During the winter months, bald eagles that nest in the northern U.S. and Canada fly south to find open water where they can feed. There are two major wintering areas in this state, one located in Sullivan County. On January 31st, 20 people joined IES Wildlife Ecologist Jay McAninch for the ecological excursion "Winter Ecology of the Bald Eagle" and drove 100 miles west to the Mongaup Falls Reservoir to observe these magnificent birds. The group was met by Peter Nye, Endangered Species Coordinator for the State of New York, who described New York's Bald Eagle Restoration Project and set up a telescope for observation of immature and adult eagles on the ice and in the trees.

In addition, the group was fortunate enough to be present when a young adult was caught for routine measurements. Mr. Nye explained the methods used for both visual and radio tagging, and weighed and measured the 3½ year-old, 12 lb. female. A short time later, the bird was released along the river, boasting a new ultra-light radio transmitter and colored leg and wing tags for easy identification. Her progress will be followed over the coming months, and it is hoped that she and other young birds will select New York as a nesting site when they reach maturity.

New Staff

EDWARD J. MILLS, weekend security guard, is a full-time student majoring in Business Communication/Urban Administration at CUNY's Bernard Baruch College. A resident of Poughkeepsie, he will be patrolling the Arboretum's buildings and grounds on Saturdays and Sundays.



SHARI LIFSON

Promotions

DONNA J. CAPREOL has been promoted to the position of assistant to the Business Office Staff. A confidential secretary since her employment at the Institute in 1985, she has been splitting her time between the Personnel and Business Offices. Her new responsibilities will include the IES payroll, a portion of accounts payable, and other Business Office duties, especially those related to the new computerized accounting system.

KASS HOGAN, program specialist in education since her arrival at the Institute in 1985, has been promoted to program leader/ecology education. She has introduced Eco-Inquiry and Eco-Issues (classroom lessons to help students understand ecology research and concepts through first-hand experience and experimentation -- see the last two issues of the IES Newsletter) to local elementary and high school classes, and is developing curricula for extended use of these programs in the New York State school system.



SHARI LIFSON



SHARI LIFSON

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species of insects deal with these defenses. Some utilize them as protection (a southwestern species of lacewing, for example, lives on sycamores and covers itself with spines from the undersides of the sycamore leaves), some incorporate plant chemicals to make themselves distasteful to predators, others neutralize the plants' poisons, and still others circumvent these poisons using behavioral strategies. As an example of the latter the milkweed beetle chews through the midline of a milkweed leaf; this incision cuts off the supply of poisonous latex, allowing the beetle to feed safely at the end of the leaf.

The evening lecture, "Better living through chemistry -- insect style" was well-attended by members of the public. In

addition to showing more of his exceptional slides, Dr. Eisner ran a film featuring his favorite species, the bombardier beetle. This insect shoots pulses of boiling liquid at its enemies when attacked. Dr. Eisner's movie camera was rolling while he used a pair of tiny forceps to pinch the beetle's leg, and the resulting footage showed the amazing accuracy with which the insect turns its abdomen and aims its weaponry at an attacker.

Insects' use of chemistry can make them extremely distasteful to predators. Lest anyone in the audience doubt that, Dr. Eisner's final slide, showing a frog's expression after it just spat out a particularly un-tasty morsel, made the fact completely clear!

Island and Marine Ecology in Bermuda

October 5th - 12th, 1987

Extend your summer into fall, and at the same time learn about subtropical island ecosystems. Explore Bermuda to become familiar with its vegetation, bird life and geology. Snorkel on the coral reefs. Learn about the challenges faced by populations living 700 miles at sea on 21 square miles of land. Stay at the Bermuda Biological Station, a year-round research and educational facility, meet the scientists and learn about current environmental research. This excursion will be led by Jill Cadwallader, who worked at the Bio-station for 13 years before coming to IES.

Registration deadline: June 1st.

Members of the Mary Flagler

Cary Arboretum \$1,000.00

Non-members \$1,110.00

Volunteers Needed for Field Study

IES Wildlife Ecologist Jay McAninch is recruiting volunteers to assist with field research. Volunteers will be working directly with scientists on tasks that will include radio-tracking opossums and live-trapping and handling a variety of wild mammals. Volunteers will be needed for all times of day and night, and on weekends. No prior training or experience is necessary, but volunteers must be prepared to work in the field under all conditions and in many types of habitat.

Interested individuals should call the Education Program office, (914) 677-5358, for application forms.

Spring Calendar

COURSES

There are still spaces in two IES Adult Education Program late spring offerings:

Special Landscape Design Workshop: Designing with Native Plant Communities and Habitats -- May 2nd; Carol Franklin, instructor.

Edible Wild Plants Workshop -- May 9th and 16th; E. Barrie Kavash, instructor.

ECOLOGICAL EXCURSIONS

For information on the following, see the Adult Education Program catalogue or call the number below:

Garden in the Woods (May 27)

Cape Cod Ecology and Whale Search (June 5-7)

The Ecology of Tivoli Bay: An Exploration by Canoe (June 13)

Ecology at Black Rock Forest (June 20)

Registration deadlines for the above excursions are approximately a month before the date of the trip, in brackets, so sign up now.

ART EXHIBITION

The staff of IES invites the public to "Ecollage", a collection of photographs, paintings, woodworking and crafts. This exhibit, in the lobby and lunchroom of the Plant Science Building, is open to the public on weekdays from 8:30-4:30 until the end of April.

SUNDAY ECOLOGY PROGRAMS

Free public programs are offered on the first and third Sunday of each month. All programs are from one to two hours long, and begin at 2:00 pm at the Gifford House unless otherwise noted. (There will be no program on Easter Sunday, April 19th.)

Tentative schedule (please call the number below to confirm the day's topic):

May 3rd - An ecological approach to habitat management (bring your own clippers!) (Mark McDonnell) - Walk

May 17th - What spring brings to the forest

(Gary Lovett) - Walk

June 7th - Wildlife on rights-of-way

(Karen Kays) - Walk

June 21st - A stream walk (Stuart Findlay)

Wear clothing and footwear appropriate for weather conditions; long pants and sturdy walking shoes are recommended. In case of inclement weather, call the Gifford House after 1 pm to learn the status of the day's program.

SCIENTIFIC SEMINARS

The Institute's weekly program of scientific seminars features presentations by visiting scientists or Institute staff. All seminars take place in the Plant Science Building on Fridays at 3:30 p.m. Admission is free. For a schedule, contact Julie Morgan at (914) 677-5343.

ARBORETUM HOURS

Monday through Saturday, 9 a.m. to 4 p.m.; Sunday, 1 - 4 p.m. The Gift and Plant Shops are open Tuesday through Saturday 11 a.m. to 4 p.m.; Sunday 1 - 4 p.m. Closed on public holidays. All visitors must obtain a free permit at the Gifford House for access to the Arboretum. Roads closed to vehicles when snow covered and during the deer hunting season.

MEMBERSHIP

Take out a membership in the Mary Flagler Cary Arboretum. Benefits include a special member's rate for IES courses and excursions, a 10% discount on purchases from the Gift Shop, six issues of the IES Newsletter each year, free subscription to *Garden* (the beautifully illustrated magazine for the enterprising and inquisitive gardener), and parking privileges and free admission to the Enid A. Haupt Conservatory at The New York Botanical Garden in the Bronx. Individual membership is \$25; family membership is \$35. For information on memberships, contact Janice Claiborne at (914) 677-5343.

Please note: The Arboretum will be closed on Good Friday, April 17th, and Easter Sunday, April 19th.

For more information, call (914) 677-5358 weekdays from 8:30-4:30.

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